VERSION WITH MARKINGS TO SHOW CHANGES MADE:

HE SPECIFICATION:

nd Paragraph **[0014]** as follows:

4] -- FIG. 3 is a winding diagram of a strand of a two-layer ing with the slot number N = 9 slots; ~~and~~--.

nd Paragraph **[0015]** as follows:

5] -- FIG. 4 is a fragmentary section view of a stator of the hronous motor according to the present invention; and

FIG. 5 is a schematic perspective diagram of a motor having or and a stator with a slot skew γ.--.

the following paragraph after **[0026]** and before **[0027]**:

G. 5 is a schematic perspective view of a motor with a stator 42 and a rotor The rotor 41 includes permanent magnets 40 which are arranged on the circumference of the rotor. The angle γ (reference numeral 50) subtended ie periphery of the stator in the axial direction between the longitudinal axis e stator and the longitudinal direction of the stator slots is referred to as "slot ".--.

1E CLAIMS:

nd the following claim:

(Amended) The synchronous motor of claim 1, wherein the stator includes a laminated core with a plurality of slots, each slot defining a slot gap and a slot width, wherein a width of the slot ~~skew of~~ gap is at least half of the a slot ~~pitch~~ width.

REMARKS

The last Office Action of November 2, 2001 has been carefully considered. onsideration of the instant application in view of the foregoing amendments the following remarks is respectfully requested.

Claims 1 to 6 are pending in the application.

It is noted that the drawings are objected to because of applicant's failure ow every feature set forth in the claims.

Claims 1-3 and 5 stand rejected under 35 U.S.C. §103(a) as being tentable over Japanese Pat. No. JP 62-185545 (hereinafter "Koichi") in view S. Pat. No. 3,673,477 (hereinafter "Broadway et al.").

Claims 4 and 6 stand rejected under 35 U.S.C. §103(a) as being tentable over Koichi in view of Broadway et al. and further in view of U.S. No. 5,030,864 (hereinafter "Van Hout et al.").

ECTION TO THE DRAWING

The objection to the drawings under 37 CFR 1.83(a) has been noted. ever, it is applicant's contention that the submission of a drawing to illustrate rotor configuration recited in claims 5 and 6 is not necessary for an erstanding of the invention. (35 U.S.C. §113 states that "applicant shall sh a drawing where necessary for the understanding of the subject matter ght to be patented."). For example, a rotor with an outer circumference and

ıding permanent magnets which are arranged on the outer circumference of rotor (claim 5) is shown in Fig. 1 of JP 62-185545 cited by the examiner. wise, permanent magnets which are arranged interiorly of the rotor, are cted, for example, in FIG. 2 of U.S. Patent 5,030,864 cited by the examiner, in FIG. 2 of U.S. Patent 5,091,668. Accordingly, those skilled in the relevant vill be able to recognize the features recited in claims 5 and 6 without the efit of a drawing.

Applicant also submits that the term "slot skew" recited in claim 1 is known e art and denotes the angle subtended on the periphery of the stator in the direction between the longitudinal axis of the stator and the longitudinal ction of the stator slots. To clarify the meaning, applicant has included a new 5 which shows the definition of the skew angle γ. The new FIG. 5 is merely ıded to define terminology used in the relevant art and does not introduce matter. FIG. 5 also shows the rotor in a configuration known from 2-185545 discussed *supra*.

The specification have been amended to reflect the incorporation of new 5.

Applicant respectfully requests that the examiner withdraw the objections e drawings under 37 CFR 1.83(a).

ECTION UNDER 35 U.S.C. §103(a)

The rejection of claims 1-3 and 5 under 35 U.S.C. §103(a) as being atentable over Koichi in view of Broadway et al. is hereby traversed and nsideration thereof is respectfully requested in view of remarks set forth w.

Independent claim 1 is directed to a permanent excited synchronous or with a stator. The stator has a winding, which includes cyclically repeating ors $|\xi_p| = 0.945$, $|\xi_{5p}| = 0.140$, and $|\xi_{7p}| = 0.060$, and a skew angle $\gamma = \frac{2\pi}{18p}$, rein p is the number of pole pairs. Claims 2-6 depend from claim 1.

Koichi discloses a 4-pole permanent magnet rotary electric machine with a core 1, permanent magnets 21-24, an armature core 3, an armature ding 4, and teeth 51-59. The stator has NS = 9 slots. None of the Figs. 1-5 of chi teaches the specific arrangement of the stator windings, which is shown in ill in Figs. 1 and 2 of the present invention and corresponds to the winding ors $|\xi_{ip}|$ recited in claim 1, nor does Koichi teach the recited skew angle. wever, applicant notes that Koichi teaches a 4-pole motor.

The winding factors are optimized for optimum operating performance of motor, taking into consideration the field distribution at the fundamental uency as well as at the harmonic frequencies. This results in different winding eria depending on the application. The winding arrangement of the present ntion is optimized for suppression of harmonic content.

The reference to Broadway et al., unlike the present invention which is :ted to a permanent-magnet excited motor, describes a pole-changing ction motor. This is an entirely different motor design, and none of the odiments disclosed in the '477 patent remotely suggest the winding pattern ed in claim 1. Although Broadway refers to the "necessity to minimize the risk ouble by designing production machines for minimum harmonic content" 2, lines 9-10), he does not suggest a winding pattern of the type disclosed in n 1.

With respect to claim 2, Broadway actually teaches away from using an number of slots, which according to Broadway "may not be the ideal coil- ı for the elimination of harmonics." (col. 2, lines 37-38). Note that Fig. 2 of the ent invention discloses the use of 9 slots. Accordingly, not only do Koichi and ıdway, taken either alone or in combination, fail to disclose, teach or suggest subject matter recited in claim 1, but those skilled in the art would have no vation to combine Koichi and Broadway to arrive at the two-layer winding 9 slots recited in claim 2.

Accordingly, Applicant respectfully requests that the rejection of claim 1 be drawn. Claims 2, 3 and 5 which depend from amended claim 1 should also patentable over the Koichi and Broadway et al. references for the same :on that claim 1 is patentable.

Applicant also wishes to point out that a motor winding can be optimized in y ways to satisfy various criteria. For example, a winding can be optimized to ide an optimum field at the fundamental frequency, either with a minimum

ıonic contribution or with a controlled harmonic field. This results in different ing factors and different winding patterns, which are not predictable simply ‹trapolation from a winding pattern known in the art.

Claims 4 and 6 were rejected under 35 U.S.C. §103(a) as being ıtentable over Koichi in view of Broadway et al. and further in view of van et al.

Claim 4 has been amended to correct a typographical error. Claim 4 now ɜs that the width of the slot gap (and not the "slot skew") is at least half of the width. This change is supported in paragraph [0022] of the specification, h states that "the gap 25 has a width which is at least half the width W of the 22".

Van Hout et al. disclose a three-phase electrical machine, in particular a motor, which avoids skewing of the poles and instead defines a particular ıt of the air gap in the tangential direction. However, the Van Hout et al. ence does not specify the winding arrangement and hence does not disclose ɜct matter material for the patentability of claim 1. Since claim 4 depends claim 1, claim 4 should also be patentable over the Koichi, Broadway and Hout references, either taken alone or in combination, for the same reason claim 1 is patentable.

Since none of the references of record, either taken alone or in ɔination, anticipate the subject matter recited in claim 1, Applicant therefore ectfully requests that the Examiner reconsider and withdraw all outstanding ‹tions and objections.

CONCLUSION

Applicant believes that when the Examiner reconsiders the claims in the of the above comments, he will agree that the invention is in no way properly or anticipated or even suggested by any of the references however they are idered.

In view of the above presented remarks and amendments, it is respectfully nitted that all claims on file should be considered patentably differentiated the art and should be allowed.

Reconsideration and allowance of the present application are respectfully ested.

Should the Examiner consider necessary or desirable any formal changes /here in the specification, claims and/or drawing, then it is respectfully ested that such changes be made by Examiner's Amendment, if the niner feels this would facilitate passage of the case to issuance. If the niner feels that it might be helpful in advancing this case by calling the ersigned, applicant would greatly appreciate such a telephone interview.

Respectfully submitted,

By: _____
Henry M. Feiereisen
Agent For Applicant
Reg. No: 31,084

: February 26, 2002
Fifth Avenue, Suite 3220
York, N.Y. 10118
) 244-5500
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